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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



"Seeing" the Earth Spin

See Page 127

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## METEOROLOGY

**Hurricane Audrey's Toll Highest in Two Decades**

► THE TOLL of life taken by Hurricane Audrey, the year's first hurricane that struck Louisiana and Texas in late June, was heavier than from any other natural disaster in nearly two decades.

At least 350 persons are known dead and a considerable number are still missing. Particularly hard hit was the village of Cameron, La., which was also inundated by a tidal wave.

Weather Bureau records show only two hurricanes have hit the United States in the month of June during the period from 1926 to 1956. Both these June hurricanes, like Audrey, concentrated their fury on the Gulf states, but caused much smaller loss of life.

Of the 49 hurricanes causing loss of life in the U. S. during the period from 1926 to 1956, 37 occurred in August or September. This number was almost equally divided between the two months, statisticians at the Metropolitan Life Insurance Company reported.

Science News Letter, August 24, 1957

## BACTERIOLOGY

**Penicillin-Resistant Bacteria Increasing**

► STRAINS of bacteria that have developed resistance to penicillin can now even be found in persons who have never had the antibiotic, Dr. J. C. Gould, University New Buildings, Edinburgh, reports in *Nature* (Aug. 10).

Antibiotic-resistant bacteria arise by spontaneous mutation. They keep increasing in the population because they have a greater chance of survival than penicillin-sensitive strains when both are growing in the presence of the antibiotic.

A strain of *Staphylococcus pyogenes* bacteria that has become penicillin-resistant is being found in increasing numbers not only in penicillin-treated hospital patients but also in medical personnel who have not received the drug.

New personnel entering the hospital are being quickly "colonized" by the resistant forms, Dr. Gould reports.

A possible explanation is that the nurses and medical staff receive enough antibiotic on their hands and from the air to kill all but the penicillin-resistant strains that may be lurking in their nasal passages.

Support for this theory came from a study of a factory which handled and distributed penicillin. Examination of healthy factory workers showed that the bacteria strains isolated from their nasal passages were similar to the resistant strains found in treated hospital patients.

These strains are both quite distinct from those bacteria found in the general population.

The amount of penicillin in the environment, Dr. Gould concludes, must be an important factor in maintaining resistant strains.

Science News Letter, August 24, 1957

## PUBLIC HEALTH

**Atom Tests Safe**

One extensive series of tests on the effects of atomic fallout on humans indicates that radiation in man has not "dangerously increased." Further tests are planned.

► ATOMIC FALLOUT from weapons testing has not dangerously increased radiation in man, the Army has found from a study of nearly 5,000 urine samples sent from military posts around the world.

This is the first time that a large scale study of radiation has been done on man himself. Up to now it was necessary to make more-or-less accurate guesses from animal studies instead of human research.

Direct measurement in man had to be done at least once by someone, and it was a "natural" for the Army because of available personnel, Lt. Col. James B. Hartgering, MC, director of the division of physiology and pharmacology, Walter Reed Army Institute of Research, and head of the project, told SCIENCE SERVICE.

For even more exacting measurements, the Army has begun construction of a whole body radiation counter and "iron room" in the basement of the Institute.

The two-year urine sampling project is now being completed and has just been declassified. The samples were put through extensive radio-chemical tests to measure strontium-90, iodine-131, cesium-137, cerium-144, zirconium-95 and ruthenium-106, all radioactive isotopes produced by nuclear bombs.

"The results have shown that from the 1955 and 1956 series of atomic tests there are insignificant amounts of these isotopes getting into man. This was expected, but proof of it was needed," Lt. Col. Hartgering said.

The urine samples were collected from 10 individuals at each station for a 24-hour period. For the 1955 series of tests samples from 17 United States and 15 foreign bases were obtained. A smaller number were used for the 1956 series since it took place in the Pacific.

All foreign samples had to be shipped by air mail since iodine-131 has a half life of only eight days and would completely disappear from the specimens within a short time.

Although urine sampling is the most practical way to study a large number of people, the whole body counter and "iron room" give much more precise measurements.

The whole body counter consists of a long cylindrical tube in which the person to be tested is placed. It can measure the total amount of gamma radiation in the body rather than just the amount being excreted by the kidneys.

Only about three of these atomic-age devices have been built, and none of them have access to as large a number of possible test subjects as the Army.

Once in operation, it is hoped that measurements can be made on persons who have been accidentally exposed to too much

radioactivity so that more exact knowledge of radiation injury will be available.

Coupled with the whole body counter will be the so-called "iron mine," a room lined with iron plates in which humans are measured for the type of radioactive particles they contain.

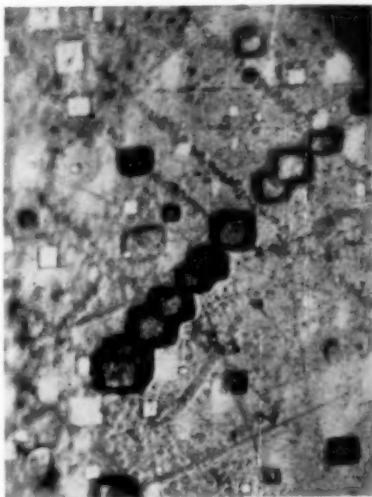
The subject is placed in a chair and a large crystal of sodium iodide is slowly moved over his body. Radioactive particles escaping from his body penetrate the crystal and cause it to generate photons. These are then picked up and counted by banks of special photon-sensitive electronic tubes which surround the subject.

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**● RADIO**

Sat., August 31, 1957, 1:45-2:00 p.m. EDT "Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Jack Masur, director of the Clinical Center of the National Institutes of Health, Bethesda, Md., will discuss "How Patients Help Medical Research."



**SQUARE BUBBLES**—Lithium fluoride crystals, irradiated with neutrons and then heated above 600 degrees centigrade, contained these square bubbles. They were magnified more than 400 times before being reproduced in this photograph. Dr. Peter Senio found the bubbles while working at General Electric Company's Knolls Atomic Power Laboratory, Schenectady, N. Y. (See SNL, Aug. 17, p. 90.)

## PUBLIC HEALTH

# Quarantine for Anthrax

An outbreak of anthrax in livestock in Oklahoma and Kansas has alerted the Department of Agriculture and the Public Health Service to protect both animals and people.

► ANTHRAX STRIKES and can kill in less than a week. It is disastrous to livestock as well as man, Dr. Francis J. Mulhern of the U. S. Department of Agriculture's animal disease eradication branch, told SCIENCE SERVICE, when questioned about the current outbreak of the deadly disease in livestock in Oklahoma and Kansas.

So far only one case of anthrax infection, the skin lesion type, in a human has been reported by the U. S. Public Health Service.

Since it can be spread by biting flies, however, Federal Government and state officials have been alerted. Death can result so quickly—within three to five days for the external or skin type and within 18 to 48 hours for the pulmonary variety—that it is necessary to have a program set up in advance to protect against the disease.

This program consists of a system for immediate reporting of the anthrax outbreak among livestock and maintaining a strict quarantine of infected areas.

Four counties in northeastern Oklahoma, hit by the disease in late July, have been enforcing a quarantine on the sale of milk and livestock. The state has vaccinated some 117,000 head of livestock. Livestock shipments into Oklahoma from some counties in southeast Kansas have also been halted in an effort to keep the anthrax from being introduced into new areas.

The significance of the present outbreak is the large number of cases reported in a limited area compared with the extensive outbreak of the disease in 1951-52. At that time there were a large number of cases of anthrax, caused by infected bone meal from Belgium, in many counties in a wide area which included Missouri, Illinois, Kansas and Indiana.

There is always danger that the disease will break out in flooded bottom lands because of the amazingly resistant nature of the disease-causing organism.

*Bacillus anthracis* forms spores which resist heat—ten minutes' boiling will not kill them—and chemical disinfectants. These spores can live as long as 25 to 30 years in the soil. When land is flooded or intense rains wash earth down, the anthrax spores may be brought to the surface and carried to farm ponds which supply livestock with drinking water. Pasture lands may be infected in the same way. It is mostly through water and feed, rather than contact between diseased animals, that anthrax is spread.

Because of the anthrax organism's association with low-lying marshy lands, it is described as endemic, or native, in such areas. Incidence of the disease is always possible there. This is one reason for the USDA's position concerning aid to stricken areas.

Oklahoma's governor Raymond Gary has

petitioned to the Federal Government for relief to help pay farmers for losses resulting from the anthrax outbreak. The Government has never paid indemnity for these losses. To start now, the USDA said, would set a precedent—besides involving considerable expense—with questionable results. There is a possibility, under investigation by the Department, that the Oklahoma counties may receive aid under flood relief. Approximately \$2,660 a day in milk purchases have been lost, farmers report, because quarantine regulations required milk be poured out.

There is no record of humans getting anthrax by drinking contaminated milk or eating contaminated meat.

Most human cases result from exposure to infected animals or from handling infected hides, skin, or animal furs and hair. Anthrax is most prevalent in the northeastern states where imported hides and related animal products are processed. In the seven-year period 1945-51, 372 cases of human anthrax were reported in the United States. Fatality for the more common anthrax, which affects the skin, generally is about 20%, although it may run as high as 40% for cases resulting from animal contact.

The arsenical drugs, and, more recently, Aureomycin and Terramycin, have been used effectively in treating the disease in humans. Of prime importance, however, is early recognition since the disease can kill within a few days.

The external form of the disease is characterized by the appearance of a reddened area on the neck, arm or face which shows a fleabite-like patch. After about one to three days this becomes a "painless, insensitive papule." Scratching can spread the infection. Tissues around the papule become swollen. Later the typical carbuncle—anthrax means carbuncle in Latin—forms. Headache, joint pains, nausea and fever may accompany the disease.

Science News Letter, August 24, 1957

## INVENTION

## Pigs Get Sprinkling On Way to Market

► TRAVELING accommodations that include a built-in shower are in store for the little pig that goes to market tomorrow.

Transportation specialists with the U. S. Department of Agriculture's agricultural marketing service say that giving pigs showers while they are enroute to market could mean many more pigs arriving fat, healthy—and alive. Each year more than \$4,000,000 worth of hogs now arrive dead at U. S. markets, reports the USDA.

Tests made of one water sprinkler cool-

ing system showed a cool pig is a happy one. Pigs that were showered appeared more comfortable, were quieter, and required more than pigs that traveled dry.

Altogether the pigs received five showers during their trip: a 21-minute shower before starting off and four 10-minute showers along the way.

No pigs died in the trailers that had the sprinkler systems while six of those shipped in regular trailers did die. Sprinkled pigs weighed in at nearly one-half pound more per trailer, with plastic lawn spaker hose value.

Installing the sprinkler system costs \$35 per animal, thus adding to their market used as the "pipe" system.

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## GEOPHYSICS

# Energy From Spotted Sun

A period of great sunspot activity, such as we are now in, means that the earth is sporadically receiving increased doses of radiation from the sun.

► THE SUN, particularly when as now sunspots mark its face, showers the earth and all space around it with tremendous amounts of energy. It is the earth's power house. Blot out the sun and the earth would die.

Light and heat are obvious. But there is also the unseen ultraviolet that can cause an even tan, or a painful sunburn from overexposure. Unseen radio waves, as well as cosmic rays, are also part of the sun's generous outpouring of radiation.

When sunspots erupt on the solar surface, tremendous increases in some of this radiation are recorded, although not in the visible or heat portion of the spectrum.

Bizarre effects, such as freak television reception, beautiful aurora displays and jumpy compass needles, are believed sunspot-caused.

Now, during an 11-year cycle of activity, is the time of sunspot maximum. The International Geophysical Year, or IGY, was scheduled to take advantage of the sun's greater activity. One focal point of this world-wide program, which lasts to Dec. 31, 1958, is the sun's behavior and resulting earthly effects. (See SNL, June 1, p. 346.)

Since the 17th century, when Galileo and

other astronomers first saw sunspots through a telescope, the black dots marching across the sun's face have been blamed for many of man's ills.

Wars, droughts, pestilence, insect outbreaks and, more recently, the ups and downs of the stock market, all have been linked to the periodic outbreak of sunspots. There is, however, absolutely no scientific basis for these suggested links. But there is a scientific basis for linking sunspots and increased solar activity, such as flares, with changes in the earth's magnetic field, with auroras, with increased bombardment by cosmic rays.

These are some of the areas scientists will study intensively during IGY. Some are even hopeful they will uncover the key to what makes our weather: Does it start at the top of the atmosphere and work down, or at the earth's surface and work outward?

There is no doubt sunspots sometimes affect radio "weather."

Sunspot activity is carefully watched and plotted by radio experts around the world, then used in making daily predictions of shortwave radio reception. The vastly increased solar bombardment of the iono-

sphere, which reflects radio waves, changes its properties so that normal long-distance communication is interrupted or difficult. Sometimes these ionospheric storms last only for minutes, sometimes a black-out will last for hours.

During IGY, the World Warning Agency at Fort Belvoir, Va., operated by the National Bureau of Standards, broadcasts special alerts when unusual solar activity is expected. Then scientists double their efforts to record the earthly effects.

Rockets zoom hundreds of miles into space at times of the special alerts. They will be armed with special instruments to catch cosmic rays, to chart the increase in solar X-rays, to count meteoric particles, to record the Lyman alpha radiation.

Brilliant auroral displays are more likely to be seen farther south than usual at times of special alerts. Everyone is asked to be a volunteer and send in at least a qualitative report whenever he sees an aurora.

When the sun erupts with black spots, flares also often occur. These are gigantic fiery flames, shooting out for tens of millions of miles from the solar surface.

The sun's present epidemic of spots is the most thoroughly scrutinized in history.

Science News Letter, August 24, 1957

## MEDICINE

## Says Citrus Flavonoids Worthless Against Colds

► CITRUS FLAVONOIDS are of little or no value in treating the common cold or any other disease, Dr. William N. Pearson, Vanderbilt University School of Medicine, Nashville, Tenn., reports in the *Journal of the American Medical Association* (Aug. 10).

The report was made to the A.M.A. Councils on Foods and Nutrition and Drugs and was prompted by the recent upsurge of interest in the flavonoids.

Flavonoids are organic compounds widely distributed in nature as coloring in flowers, fruits, tree barks and vegetables. The most important commercial source for them is citrus rind. They have been advertised as effective in treating the common cold.

Reports on several small studies were enthusiastic about the flavonoids effect on common respiratory infections, because of their supposed ability to strengthen capillary walls. Larger studies do not confirm this.

The compounds do appear to have some effect on strengthening capillary and blood vessel walls and to possess some mild blood-vessel-constricting effects, but these properties are weak when compared to those of other available drugs, Dr. Pearson reports.

The flavonoids' effects on such diseases as hypertension, diabetes, rheumatic fever, arthritis and various blood diseases have been studied but the testing procedures have been generally unreliable.

"Those workers who claim therapeutic value for the flavonoids have not supported their claims with data obtained from well-controlled clinical studies," Dr. Pearson reports, concluding that until such studies are made the flavonoids have to be considered of doubtful value.

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**ENVIRONMENT OF PEACE AND HOPE**—The outdoor garden and patio shown in the photograph is representative of a new approach to the problems of the mentally ill. It is part of the South Florida State Hospital in Hollywood. Throughout the grounds and in the design of the buildings, architects have tried to provide restful and hopeful surroundings. A decorative garden wall, rather than a confining fence, is suggested by the lattice design of the concrete block wall.

## PSYCHIATRY

## Describe "Fusion Center"

► **DISTURBANCE** of one area of the brain can make you not only see double, but hear double. It can also make you think double.

Dr. Max Levin of New York Medical College points to several cases in a report in the *American Journal of Psychiatry* (Aug.). The doubling, he indicates, can be caused by toxic delirium, for example, from too much alcohol, by schizophrenia or by brain tumor. It can also occur when the particular area of the brain is stimulated with electric current.

He quotes a description of an incident which took place in the operating room at the hospital of McGill University, Montreal, Canada. When the doctor counted aloud while stimulating a certain temporal area of the patient's brain, she heard the numbers doubled. As soon as the current was discontinued, the numbers became "single and clear."

Another patient had a brain tumor. She had a son William whom she called Bill. Now she said she had twin sons, Willie and Bill.

It is not correct, Dr. Levin emphasizes, to think of the brain center related to this doubling as a "duplication center." Instead, stimulation of this center acts negatively to throw the fusion mechanism out of order.

When you listen to a sound, it excites two auditory reception areas, one in each side of the brain's cortex. But a higher coordinating mechanism fuses the two auditory

images so that you hear one single sound.

In a similar way the images received by your eyes are fused. If you are normal and healthy you see a single object as only one.

The failure of fusion can also come in thinking as well in sensing. This happened to the patient whose son turned, in her mind, into twins.

Normally a person can tell whether an incongruity is real or only illusory. If John Smith is a son and also a father, only a sick person would say that this cannot be and there must be two John Smiths.

The faulty thinking may involve not only lack of fusion, but also too much fusion. This is what happens when the child tries to pick up the toy pictured in his story book. The child cannot separate mentally the actual toy from its picture.

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## EDUCATION

## Tests Alone Do Not Pick Talented Students

► **NEARLY 40%** of England's brightest youngsters go undetected and never reach a university, Sir Cyril Burt, emeritus professor of psychology at the University of London, said in the Walter Van Dyke Bingham lecture delivered at University College, London.

Intelligence tests alone cannot be relied

upon to find these bright students who are so important to our society.

"Predictions based on them show much the same accuracy as the forecasts based on the latest odds for race horses entered for the Derby," he declared.

In this technological age, one of our greatest needs is more research into the problems of mental inheritance and on the discovery of high ability.

The latest research on the microscopic structure of the human brain, carried out in the laboratories at University College, has revealed wide differences in the cell architecture of different brains, but demonstrates that, in the same individual, nerve tissue—like every other tissue, hair, bone, muscle, and skin—tends to be the same throughout, with only minor local variations.

"This, as well as wide-scale statistical inquiries, strongly supports the theory that general mental capacity is far more important than special gifts or aptitudes," Sir Cyril said.

And if differences in this capacity are the result of differences in brain structure, we should expect that, like other physical differences, it could be largely dependent on heredity.

Yet the study of mental heredity, he indicated, has until quite recently, been scandalously neglected.

Science News Letter, August 24, 1957

## BIOLOGY

## Football Players Hurt By Too Early Scrimmage

► **FOOTBALL PLAYERS** would not receive as many early season injuries as they do if they were kept from scrimmaging until they are in prime physical condition, Dr. Don H. O'Donoghue, University of Oklahoma School of Medicine, Oklahoma City, reports in *GP*, a publication of the American Academy of General Practice.

The player must be convinced that a fit body is his best insurance against injury, and he must play with "carefree abandon." The player who fears injury will surely be hurt, Dr. O'Donoghue advises.

In the past the physician was considered to be an athlete's last resort and the general fear was that once the player reached the doctor, his days as an athlete were over.

Too often this turned out to be true since the players were sent to the doctor far beyond the ideal time for immediate treatment.

The doctor also tended to belittle the athlete's desire to return to competition.

The first thing for the physician to determine is whether a boy is physically capable of participating in sports. Dr. O'Donoghue warns fellow physicians that it is almost as bad to be overconservative as to overlook obvious hazards.

Questions like "Does this functional heart murmur really constitute a hazard?" or "Are these bones really over-brittle?" must be answered honestly.

For football, especially, good equipment is essential for protection and will pay for itself by reduced medical expenses and added effectiveness of the players.

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**METAL WHISKERS**—"Perfect" metal whiskers, formed by electro-deposition (see SNL, Jan. 12, p. 21), are known for their freedom from flaws and resulting extraordinary strength. Dr. David Vermilyea of General Electric's metallurgy and ceramics research department is shown here adjusting the level of copper sulfate solution and watching through a microscope as copper is deposited on the whisker. The whiskers are initially formed by means of the reduction of copper chloride in hydrogen.

## ASTRONOMY

# Stars' Darkness Explained

► THE MYSTERIOUS darkness of the rare giants called carbon stars has apparently been explained by two University of California scientists who simulated part of the giants' atmospheres in the laboratory.

The stars, which have an excess of carbon, measure a hundred times or more the diameter of the sun. They appear to be much hotter than the sun at the center. Yet their ultraviolet light, a natural component of all light sources, is so weak as to be nearly undetectable.

Searching for a reason for the darkness, Drs. John G. Phillips, astronomer, and Leo Brewer, chemist, heated materials in a small electrical furnace.

Although the laboratory temperatures reached, 2,000 to 3,000 degrees centigrade, correspond only to the temperatures of the atmospheres of the cooler stars, they were high enough to create bizarre molecules of carbon. Of special interest was one in which three atoms of carbon are linked.

The spectrum of this carbon molecule, which does not exist at ordinary tempera-

tures, corresponds to a very strong carbon spectrum found in the giant stars.

The existence of large quantities of this molecule in the atmospheres of carbon stars could account for absorption of most of the ultraviolet light, explaining the great weakness of this part of the spectrum, the scientists said.

The carbon stars are interesting because, in addition to having an excess of carbon, they appear to be "factories" of heavy elements that may be changing the chemical composition of the galaxy.

The enormous heats at the centers of the carbon stars, approaching a hundred million degrees absolute, generate neutrons which are added to lighter elements in successive nuclear transformations. The resulting heavy elements apparently are eventually spewed into space through diffusion or explosion, with the possibility that the chemical composition of the galaxy may be changing in the direction of a gradual increase in the heavier elements.

Science News Letter, August 24, 1957

## MEDICINE

# Find Possible Cancer Link

► TOO GREAT a production of hormones may be associated with human lung cancer, Dr. Sheldon C. Sommers, a pathologist at Boston University, has discovered.

The scientist studied the hormone-producing glands of 210 men and women who died of lung cancer and found that the biggest gland changes had taken place in women with adeno cancer of the lung, a form of the disease in which the gland-like parts of the lung are involved.

These women showed overgrowths of ovarian tissue, breast tissue and uterine linings two or three times more frequently than normal, Dr. Sommers reported.

This indicates overactivity of the female ovarian hormone estrogen, he explained.

The women also showed increases in the pituitary glands which produce growth hormone and adrenal glands which produce sex and stress hormones.

Only 11% of the women with adeno cancer had completely normal glands while 63% of non-cancerous women did.

Evidence of increased hormone production was also found in men. Pituitary cells were increased in 80% or 90% of the cases, while this was found in only two percent of a control group. Lung cancer cases also showed a high frequency of abnormality of the male sperm-producing cells.

These and other studies support a theory that cancer may be produced in two stages. In the case of epidermoid lung cancer, the type associated with cigarette smoking, the first stage of tissue overgrowth may be caused by one or a combination of irritants, including air pollution, bacteria, allergens and tobacco.

Then the second stage, cancer production, might be brought about by tissue response to changes in the pituitary, adrenals and possibly other glands.

The research was reported by the Massachusetts division of the American Cancer Society.

Science News Letter, August 24, 1957

## VIROLOGY

# Learn How Viruses Kill Living Cells and Spread

► HOW VIRUSES execute living cells and spread infection may be explained by research reported by University of California scientists in the *Journal of General Physiology*.

Apparently when viruses invade an injured cell, they force the cell to manufacture a special kind of chemical, an enzyme called virolysin. This chemical attacks a sugar-like substance that holds the cell wall together, causing a virtual explosion of the cell wall. In the explosion, the viruses are released, to invade other cells.

This picture of virus infection is suggested by Drs. Doris J. Ralston, Miriam Lieberman, Beatrice S. Baer, and Dr. A. P. Krueger of the department of bacteriology, whose research was supported by the Office of Naval Research.

The scientists discovered virolysin about two years ago. At that time they were studying another cell-exploding enzyme called autolysin, which bursts cells after they are dead. Virolysin was popping cells prematurely.

The scientists showed that virolysin is

present only in infected cells and not in normal ones. Autolysin, on the other hand, is present in both normal and infected cells.

The demonstration that viruses can force a cell to manufacture a new enzyme, namely virolysin, is the first time this capacity of viruses has been demonstrated.

The work is the first experimental evidence of the correctness of the theory upon which extensive research for anti-viral drugs has been based, namely, that viruses can generate new enzyme systems.

The work thus strengthens the hope that the current line of drug research may succeed. A successful drug against a virus probably would be one that will destroy only the new enzyme produced by the virus without affecting the normal components of the cell.

The research was done with viruses that attack bacteria.

Science News Letter, August 24, 1957

## SOCIOLOGY

# Most Men Like Their Jobs And Want to Work if Rich

► WHAT WOULD YOU do if someone gave you enough money on which to retire comfortably?

The chances are you would want to continue to work and the odds are better than even that you would continue to do the type of work you are doing.

These are some of the findings of a nation-wide study of the meaning of work conducted by the Survey Research Center of the University of Michigan's Institute for Social Research in Ann Arbor.

The study shows that four out of every five American men now working would want to go right on working even if they inherited enough money on which to live comfortably without the weekly pay check.

Some persons would use the opportunity to switch their type of present work, if they could. But more than two-thirds of the nation's farmers and three-fifths of the men in middle class jobs would still stick to the work they are doing.

Having a job means a good deal more than just making a living, Nancy C. Morse and Robert S. Weiss, who wrote the report of the study, conclude.

Professionals, managers employed by others and sales personnel claim their work is too interesting or full of prestige to want to quit. Skilled laborers say life without work would seem equivalent to life without anything to do.

Among the classes of employees, the study reveals, only the unskilled show any major difference in their desire to stay on the job. Almost half of them would quit if they did not have to earn a living.

Persons in less interesting and less prestigious jobs are more likely to want to change jobs if they had the chance. Most want to go into business for themselves, "a transition not seen as requiring much additional formal education and training."

When viewed together, the researchers report, American men like their work and 80% say they are either "very satisfied" or "satisfied" with their jobs.

Science News Letter, August 24, 1957

## PHYSIOLOGY

**Brain Goes Without Oxygen for 20 Minutes**

► THE SUCCESSFUL RECOVERY of a man whose brain had gone without oxygen for nearly 20 minutes, instead of the accepted limit of five minutes, is reported by four Illinois scientists in the *Journal of the American Medical Association* (Aug. 10).

The patient was a 24-year-old man whose brain was oxygen-starved for 19 and one-half minutes while a gunshot wound in his heart was being repaired.

During the operation the patient suffered several severe hemorrhages in an artery leading to the brain, including one which kept him in a shock-like state for the 19 and one-half minutes.

An electroencephalograph, attached to his brain during the operation, showed that electrical activity in the brain's cortex or outer layer stopped altogether during this time. The stoppage was apparently due to the lack of blood flow.

The patient's safe recovery was attributed to the use of both hypothermia and the tranquilizer chlorpromazine, both of which served to protect the brain. In hypothermia, the temperature of the body is reduced so that its functions are slowed and it requires less oxygen during surgery.

A battery of psychological tests were given the patient before and after the surgery, and the results showed that the operation caused no significant change in his mental abilities.

The unusual case is reported by Drs. Robert L. Tentler, Max Sadove, Dorothy R. Becka and Robert C. Taylor of the Veterans Administration Hospital, Hines, Ill.

Science News Letter, August 24, 1957

## FORESTRY

**Drug Treatment Saves Western White Pine**

► DAMAGE from blister rust, a fungus disease that annually destroys enough sawtimber to build more than 62,000 five-room houses, can be cut by treating affected trees with an antibiotic drug.

Acti-dione successfully halted the spreading fungus in a four-year trial of the drug on a stand of western white pine, Virgil D. Moss, forester with the U. S. Forest Service's division of blister rust control, reports. A single application of Acti-dione killed between 77% and 80% of the cankers treated. Treatment consisted in pruning infected branches and partially cutting away trunk cankers in order to expose the disease-causing fungus. The drug, mixed with oil, was then applied to the cut surface.

In Idaho, Montana, Washington, Oregon and California blister rust is a menace on almost 8,000,000 acres of pines valued at an estimated \$1.5 billion.

The disease attacks currant and gooseberry plants, or Ribes, as well as pine, alternating between the tree and the plant. The fungus spreads from nearby Ribes, enters the tree through its needles and grows down the branch, eventually entering the trunk.

After about three years, the resulting trunk canker of swollen bark breaks open. This allows wood-rotting fungi and insects to enter. When the canker encircles the trunk the tree is killed.

Control of the disease in the past has been mainly by destroying the Ribes since the disease cannot spread from tree to tree. With Acti-dione, however, the forest pathologist has a new control method. Treatment programs that include thousands of infected small trees in national western white pine forests have begun.

Science News Letter, August 24, 1957

## EDUCATION

**College Teacher Shortage To Be Most Crucial Need**

► A COLLEGE teachers' shortage will be the nation's most crucial educational problem by 1970, the President's Committee on Education Beyond the High School has reported.

Pointing out that the number of persons who want to go to college is expected to double within the next 12 years, the Committee warned that between 180,000 and 270,000 new college teachers must be recruited to meet the increase.

Four lines of attack can be made to meet the foreseeable need of such teachers:

1. Deliberate, organized recruitment, plus continuing employment of competent older teachers;
2. Expansion and strengthening of graduate programs;
3. Finding ways to teach larger numbers without loss of quality;
4. Making the teacher profession more attractive through improving its status, particularly its economic status.

The Committee, headed by Devereux C. Josephs, chairman of the board, New York Life Insurance Co., also examined four other major problem areas and made recommendations in each. The areas covered in this second and final report to the President include the need for assistance to students, expansion and diversity of educational opportunities, financing higher education, and the Federal Government's role in education beyond the high school.

Science News Letter, August 24, 1957

## TECHNOLOGY

**Synthetic Tires Hold Up in Storage**

► THE TAXPAYER'S pocketbook received a cushion with the report that an all-synthetic, heavy duty truck tire for the Army has been developed.

Promising to save countless defense dollars, the tires are designed to resist deterioration in storage. Made of butyl, a synthetic rubber created from oil refinery gases, the truck tire is said to virtually eliminate ozone cracking and deterioration, particularly in the tread area.

Scientists of the Pennsylvania Tire Company of Mansfield, Ohio, and the Esso Research and Engineering Company of New York conducted the research.

Science News Letter, August 24, 1957

**IN SCIENCE**

## ANIMAL PHYSIOLOGY

**Underwater Sounds From Sperm Whales Heard**

► SOUNDS ranging from sharp clicks, a "grating sort of groan" and a muffled smashing noise are apparently made by sperm whales.

Two American scientists report in *Nature* (Aug. 10) that while off the North Carolina coast, in late March, 1957, they encountered five sperm whales and were able to distinguish the three different sounds.

The scientists, L. V. Worthington and William E. Schevill of Woods Hole Oceanographic Institution, Woods Hole, Mass., did not have equipment on board their vessel, the Atlantis, for making phonographic recordings of the whales' sounds. However, they describe their results as "reliable evidence" that the sperm whale, along with the porpoise and a few other related animals, does make underwater sounds.

Nineteenth-century sperm whalers often claimed to have heard their quarry and this now seems to be probable.

Science News Letter, August 24, 1957

## AGRICULTURE

**USSR Agriculture Hurt By Lysenko Theories**

► RUSSIAN agriculture was damaged to the extent of possibly hundreds of millions of dollars and a near-disaster to the potato industry was caused by the unsound theories of T. D. Lysenko, "the Stalinist Svengali of Russian science."

So reports Dr. Anton Lang, plant scientist at the University of California at Los Angeles. Dr. Lang, a native of Russia now a naturalized U. S. citizen, has followed Soviet plant science closely for many years.

Dr. Lang evaluates the effect of Lysenkoism on Russian agriculture in *Plant Science Bulletin*. Lysenkoism is the doctrine of inheritance of acquired characteristics expounded by the Soviet scientist.

Planting procedures for potatoes recommended by Lysenko have resulted in almost complete extinction of certain early varieties formerly grown widely in Russia, Dr. Lang reports. Since the potato is one of Russia's most important crops, this approaches a major disaster.

Lysenko's opposition to planting of hybrid corn, a standard practice in the world's leading corn growing areas, set the Russian corn industry back at least 20 years. Cotton and wheat production also suffered under the Lysenko "regime."

As far as Russian agriculture is concerned, Lysenko's influence seems to be on the wane, Dr. Lang says. "His downgrading may be in time enough to save other crops from disaster."

Science News Letter, August 24, 1957



# THE FIELDS

## ARCHAEOLOGY

### Ancient Toltec Colony Found in Western Mexico

► A PREVIOUSLY unknown Toltec colony has been discovered on the west coast of Mexico, representing the westward limit of expansion of this ancient civilization.

The site has been officially explored for the first time by archaeologists from the University of California at Los Angeles, under the direction of Dr. Clement Meighan. The expedition was sponsored by Phil Berg, a Los Angeles executive.

The site lies along Mexico's new West Coast highway near the city of Tepic. Dr. Meighan estimates the colony reached its cultural peak about 1200 A.D.

Relics from the site represent a higher degree of cultural achievement than had previously been thought to exist in this region during this period, Dr. Meighan said.

They include excellent examples of pottery of six-color decor, figurines, bronze axe-heads, copper pins and tweezers, and a whistle with an authoritative tweet that would "make a basketball referee green with envy."

The pottery is described as being of high quality with exquisite patterns in six different colors. Much of the pottery appear to be art objects rather than utilitarian items. Some of it was apparently used only in connection with burial rites.

Science News Letter, August 24, 1957

## CHEMISTRY

### Chromium Chemical Makes Ruby Redness

► SCIENTISTS have found why the redness of rubies comes from a green chemical, a compound of the same metal chromium that is used to put glittering platings on automobile trim.

Delving into the secrets of these fascinating jewels, Dr. L. E. Orgel of the department of theoretical chemistry, at Britain's University of Cambridge, describes his researches on rubies in *Nature* (June 29).

Most jewels are really a "solid solution" of some chemical compound, usually a metal oxide or silicate, in a basic mineral or "matrix." These metals are really impurities, making jewels "contaminated minerals," and the color of the jewel is very close to that of the metal compound dissolved in its matrix.

In the case of rubies, the effect is just the opposite. Chromium oxide, a green chemical, dissolved in an aluminum oxide matrix, a colorless or white substance, gives not a green stone but a red one: the ruby.

Dr. Orgel, investigating this property, made use of the fact that synthetic rubies could be made only if the chromium content of the melted aluminum oxide was

below eight percent. Above this, the ruby would become green-colored.

Measurements of the minute distances between the atoms in red rubies and "green rubies" showed that above eight percent chromium, the chemical bonds between the aluminum and the chromium atoms and the matrix "softened up," allowing the true green color of chromium to show through.

Below eight percent, the tight aluminum oxide crystal structure literally "squeezes" the chromium atoms, shortening the interatomic bonds as much as four percent. This shortening causes the shift in color from green to red.

Science News Letter, August 24, 1957

## ENGINEERING

### Study Tiny Tempests on Aircraft, Missile "Skin"

► STRUCTURAL FAILURE of the "skin" of aircraft and missiles traveling at supersonic speeds may be due to tiny tempests that rage over it.

This phenomenon, known as panel flutter, is the subject of research by John Miles, professor of engineering at the University of California at Los Angeles.

Panel flutter has been a suspect in certain structural failures ever since such defects were noticed in the first German V-2 rockets, Mr. Miles pointed out. But the forces acting to cause the failures were not known.

The action is very similar to that of ocean waves generated by high winds or the flutter of a flag. In fact the study has thrown new light on wave formation in the ocean.

The study has indicated that the effect is eliminated with thicker "skins."

Practical design criteria are currently being worked out to assure that "skin" thickening does not pose a weight problem, a particularly critical area in missiles, Mr. Miles said.

Science News Letter, August 24, 1957

## CHEMISTRY

### Chemists Develop Most Sensitive Test for Metals

► A RAPID and convenient method for measuring the metal content of solutions has been developed. It is so sensitive it is affected by the tiny amounts of lead dissolved from the glass of much ordinary laboratory equipment.

Dr. Irving Shain, professor of chemistry, and Richard D. DeMars, research assistant, University of Wisconsin, Madison, reported the new electrolytic method that can measure one part of lead in five trillion parts of solution. The basis of the technique is an electrode consisting of a tiny drop of mercury hanging from a platinum wire. Any metal that will alloy itself with mercury can be tested.

Using this method, the Wisconsin chemists can measure concentrations as small as seven billionths of an ounce of lead or two billionths of an ounce of zinc in a quart of solution.

Science News Letter, August 24, 1957

## ICHTHYOLOGY

### Narcotic From Pistol Subdues Sharks in Sea

► FOUR HUNDRED pounds of ocean-swimming shark can be knocked out in one minute or less with a water pistol full of a narcotic known as M.S. 222, Dr. Perry W. Gilbert and F. G. Wood Jr. of Cornell University, Ithaca, N. Y., report in *Cornell* (Aug. 2).

Large sharks and rays were needed for a study of mating habits and of all the tranquilizers and anesthetics tried, M.S. 222 was the most useful.

The large fish are brought alongside of the boat and their heads are pulled up out of the water. Then a solution of the narcotic is squirted into the mouth of a shark or the spiracles of a ray and sprayed over the gill openings.

A water pistol, rubber-bulb syringe, or pump-type hand sprayer can be used, the authors report.

Within 15 seconds, the drug begins taking effect. The fish can then be safely handled either in or out of the water. The first stages of recovery take place within five to 30 minutes after the shark is put back in the water. After that, the drug wears off gradually and completely, and the fish are unharmed.

Science News Letter, August 24, 1957

## TECHNOLOGY

### New Conduit "Pipes" Microwave Radio Signals

► "PIPING" SHORT radio waves around corners and sharp angles is expected to be made easier by a new lightweight "traveling-wave" conduit tube announced by the Radio Corporation of America.

One property of the very short radio waves or microwaves, measured in inches or less, is that they can be "piped" for short distances through tubes and conduits somewhat like water. One disadvantage of present high-sensitivity microwave conduit systems is the need for 30-pound electromagnets to focus the waves precisely down the axis of the conducting tubes. The alignment of the large electro-magnets is affected by vibration, changes in environment and changes in temperature, and must be adjusted periodically.

The new tube, developed by Dr. K. K. N. Chang of RCA's David Sarnoff Research Center, dispenses with the huge electro-magnet, using instead a compact electrostatic focusing element built into the tube, and permanently aligned.

Dr. Chang explained that the focusing element in the "plug-in" traveling wave tube consists of two pairs of spiral windings. The larger outer pair carries the microwave signals, and the inner pair lies within a tubular electron beam and helps the outer pair in beam focusing.

Successfully operated in the research stage, Dr. Chang predicted the tube's future use as an electronic amplifier in airborne radar and countermeasures equipment as well as microwave communications systems.

Science News Letter, August 24, 1957

## ASTRONOMY

# Venus, Saturn Now Seen

Although Venus is becoming brighter in the evening sky, it is still retiring early from view. September will have a kind of replacement for Venus—the "harvest moon."

By JAMES STOKLEY

► THE PLANET Venus is gradually brightening, and becoming more prominent in the evening sky. However, it still sets about an hour and a half after the sun. This is before twilight has completely ended, and the sky has become dark. If you look toward the southwest as dusk gathers, Venus will soon appear. Of magnitude minus 3.5 on the astronomical brightness scale, it exceeds any other star or planet. It is in the constellation of Virgo, the virgin, and close to the star called Spica, which is so much fainter that it will be considerably more difficult to locate.

The accompanying maps are drawn to show the appearance of the evening sky at about 10:00 p.m., your own kind of standard time—add one hour for daylight-saving time—at the first of the month, an hour earlier at the middle and two hours earlier as September gives way to October. Thus, Venus does not appear upon them.

They do, however, show the second planet of the September evening.

This is Saturn, which stands in the constellation of Ophiuchus, the serpent-bearer. During the early evening Saturn is in the southern sky, but it moves toward the southwestern horizon and goes down, at the beginning of the month, around 11:00 p.m. by your kind of standard time.

## September's Brightest Star

Brightest star of the September evening is Vega, in Lyra, the lyre, high in the west. Directly overhead is Cygnus, the swan, in which Deneb may be seen. This group is also called the Northern Cross. Deneb marks the top of the cross, toward the northeast. Moving down from Cygnus, toward the southwest, one comes to Aquila, the eagle, of which Altair is the brightest star.

Three other stars which, like these, are of the first magnitude, are also shown on the maps. These are all so near the horizon that they appear considerably fainter than if they were high overhead.

This is a result of the absorption of their light by the greater thickness of the earth's atmosphere which must be penetrated. Low in the northwest is the figure of Bootes, the bear-driver, with Arcturus. Next, to the right, is the Great Dipper, which is part of Ursa Major, the great bear. The dipper's handle extends toward Bootes, and if you follow the curve of the handle, it brings you directly to Arcturus.

Farther right, low in the northeast, is Capella, in Auriga, the charioteer, which

will become prominent in the winter evenings.

High in the southeast are four stars which form the "Great Square" in the constellation of Pegasus, the winged horse. Below this is Aquarius, the water-carrier, one of the constellations of the zodiac, the path of the sun, moon and planets. And below Aquarius we find Piscis Austrinus, the southern fish, with the first-magnitude Fomalhaut, also dimmed by its low altitude. For our latitudes, it never rises much higher than it is now; you have to travel southward to see it high in the sky.

## Mercury Becomes Morning Star

As for the other planets, Mars and Jupiter are now both too nearly in line with the sun to be observed. Mercury, on Sept. 9, passes nearly between the earth and the sun, but by the 25th it will be farthest west of the sun. It will rise ahead of the sun, and for a few days around that date will be visible as a morning star, in the east just before sunrise.

On Sept. 23, at 2:27 a.m., EST, the sun will be directly over the equator, at the halfway point of the southward journey in the sky which it began last June. This is the autumnal equinox which marks the beginning of autumn in the Northern Hemisphere and of spring in the Southern.

On the night of Sept. 8 the moon is full. This is the "harvest moon" and we can see what it means if we consult a table that gives the times of moonrise, and see how much later this occurs on succeeding nights, at different times of year. On Sept. 9, we find, the moon will rise (at 40 degrees north latitude) only 28 minutes later than it did on the eighth.

Next March, on the other hand, the difference will be much greater.

The moon will be full on the fifth and the difference in time of moonrise, between

that night and the next, will be 74 minutes. Thus, in September and October, when the moon is full and bright, it rises about the same time for several evenings.

## Harvest Moon for Farmers

As John Ferguson wrote in a book on astronomy published in 1757, explaining why this is called the harvest moon:

"The farmers gratefully ascribe the early rising of the full moon at that time of year to the goodness of God, not doubting that He had ordered it so on purpose to give them an immediate supply of moonlight after sunset, for their greater convenience in reaping the fruits of the earth."

The reason for the differences in the delay of moonrise from one night to the next is found in the changing angle made at various times of the year by the ecliptic, the path which the moon closely follows.

It makes a trip around the ecliptic about once a month; each night it is about a twenty-ninth of its circumference farther east. Thus, being farther east, it rises later—about 52 minutes on the average.

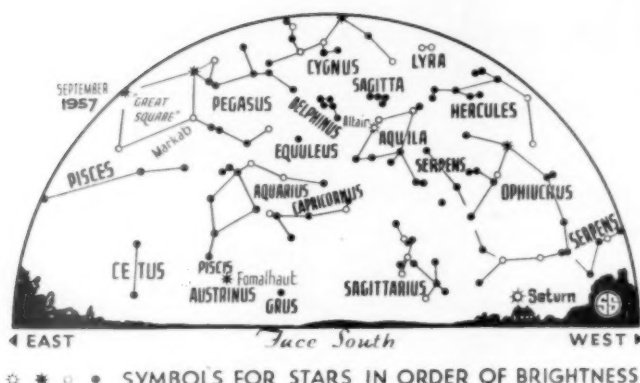
At this time of year the southernmost part of the ecliptic is in our evening sky—it passes through Sagittarius, the archer, and the line is not far from parallel to the horizon. Hence, the moon's daily eastward movement is utilized in moving it horizontally to a considerable degree. Just before moonrise it is not much farther below the horizon than it was the night before.

In March, on the other hand, the ecliptic is nearly vertical, and the same eastward movement of the moon takes that body considerably farther below the horizon, thus making the greatest changes at moonrise.

## Hunter's Moon

In October, conditions will be quite similar to what they are in September. Again there will be relatively little delay in moonrise from one night to the next when it is full. This is again on the eighth, and it will rise only 30 minutes later on the ninth. This is called the "hunter's moon," since the hunter is supposed to benefit at that time.





### Celestial Time Table for September

Sept. EST

- 8 12:00 noon Moon farthest, distance 252,000 miles.  
 11:55 p.m. Full moon (Harvest Moon).  
 16 11:02 p.m. Moon in last quarter.  
 21 10:00 a.m. Sun and Mars in line with earth.  
 22 Midnight Moon nearest, distance 222,300 miles.  
 23 2:27 a.m. Sun over equator, autumn com-

- mences in Northern Hemisphere.  
 21:18 p.m. New moon.  
 25 2:00 p.m. Mercury farthest west of sun; visible for a few days around this date low in east before sunrise.  
 26 1:12 p.m. Moon passes Venus.  
 28 8:56 a.m. Moon passes Saturn.  
 30 12:49 p.m. Moon in first quarter.  
 Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, August 24, 1957

### ASTRONOMY

## Early Stars Were Brighter

A study of the atmospheres of the B stars leads astronomers to believe that billions of years ago the stars were much brighter than they now are.

► THE SKIES were adorned with much brighter stars billions of years ago than they are now and the rate of star creation then was much faster than now.

So conclude Drs. L. H. Aller and Jun Jugaku of the University of Michigan Observatory from a study of the atmospheres of the very young, hot and bright objects known as B stars. The astronomers reported results of their study, supported by the National Science Foundation, to the American Astronomical Society meeting in Urbana, Ill.

B stars are only a few million years old, very young on the astronomical time scale that dates the sun's formation as five billion years ago. They are believed formed from interstellar gas in the spiral arms of the Milky Way galaxy in which the earth and sun are found.

Since B stars consume their nuclear fuel, hydrogen, at a rate hundreds of times faster than does the sun, their lifetimes must be relatively short. By comparing the sun's composition with that of a young B star, Drs. Aller and Jugaku hoped to find the amount of element building occurring in the last four billion years.

According to the present ideas of stellar evolution, the heavier elements are produced in the dense, hot cores of massive stars, which subsequently spew these materials into interstellar space. The interstellar material is again collected into stars and the

same process is repeated in the more massive objects.

The sun is thus, since it was formed so many millennia ago, believed to have a smaller fraction of heavier elements than has a star made only "recently" from interstellar gas.

Although the problem of comparing the sun's atmosphere with that of a young B star is very complex and not very accurate, Drs. Aller and Jugaku found that some elements, such as silicon and oxygen, do not seem to be substantially greater in the young stars than in the sun.

Therefore, they conclude, the rate of element building, and of star formation as well, must have proceeded at a much slower pace since the sun was formed than it did in the early stages of the Milky Way galaxy.

The interstellar gas from which stars are formed is being continuously renewed by an outward flow of gas from the galactic center, or nucleus, Dr. Sidney van den Bergh of Perkins Observatory, Delaware, Ohio, reported to the meeting. The present rate of gas lost from the nucleus about equals the rate at which gas is lost from the spiral arms by star formation, he has calculated.

Dr. van den Bergh based his conclusion on the recent findings that the Milky Way galaxy, as well as the Andromeda nebula, contain "surprisingly" small amounts of interstellar gas.

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### ASTRONOMY

## Minor Planet Named NORC for Giant "Brain"

► ONE OF the hundreds of minor planets, or asteroids, circling the sun between the orbits of Mars and Jupiter, is now officially named NORC, in honor of the giant electronic "brain" used to calculate the orbits of these small, star-like bodies.

The asteroid NORC was discovered by Dr. S. Arend of the Royal Observatory, Uccle, Belgium, on Sept. 1, 1953. By international agreement, the discoverer names a new minor planet, but Dr. Arend has granted this right to Dr. Paul Herget, director of the Cincinnati Observatory in Cincinnati, Ohio.

NORC is short for the Naval Ordnance Research Calculator at Dahlgren, Va., one of the most powerful electronic computers in existence. It was developed at the Watson Scientific Computation Laboratory under the direction of Dr. W. J. Eckert.

Dr. Herget reports that the computer has already provided a "vast amount of computations" on minor planet orbits, with more expected in the future. Use of NORC for this time-consuming chore was made possible through the assistance and cooperation of the Naval Proving Grounds, the Office of Naval Research and the National Science Foundation.

Science News Letter, August 24, 1957



COMET MRKOS—This year's second naked-eye comet is shown here in a photograph taken on Aug. 12 at the University of Michigan's observatory at Portage Lake. Prof. Freeman D. Miller of the University took the photograph at a 15-minute exposure. Its tail is estimated at 2,000,000 miles long. Comet Mrkos was about 100,000,000 miles from the earth as seen here. Seen in the northeast, it is now receding from both the earth and the sun. (See SNL, Aug. 17, p. 103.)

# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N. Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**ABSTRACTS OF SOVIET MEDICINE:** Part A, Basic Medical Sciences; Part B, Clinical Medicine; Vol. 1, No. 1—Martinus W. Woerdeman and others, Eds.—*Excerpta Medica Foundation*, Part A 98 p., Part B 185 p., paper, quarterly, \$15.00 per year for each part or \$25.00 for both. Abstracts in English prepared by the Soviet specialists most qualified and edited by a permanent editorial committee of 30 Soviet scientists.

**ALLERGY—A STORY OF MILLIONS**—Committee on Public Education, American Foundation for Allergic Diseases—*Public Affairs Committee*, Public Affairs Pamphlet No. 253, 28 p., illus., paper, 25 cents. It is estimated that some 17,000,000 Americans suffer from allergy. This booklet describes the various kinds and tells what can be done about them.

**ANTHROPOLOGY AND HUMAN NATURE**—M. F. Ashley Montagu—*Porter Sargent*, 390 p., \$6.00. Purpose of the book is not just to interest and amuse, but to increase understanding of the nature of man, and of his capacity and need for love and cooperation.

**AN ARCHAEOLOGICAL SURVEY OF WEST CENTRAL NEW MEXICO AND EAST CENTRAL ARIZONA**—Edward Bridge Danson—*Peabody Museum*, Papers Vol. XLIV, No. 1, 133 p., 16 plates, paper, \$4.50. Through this survey it has been made possible to follow the prehistoric trade routes and note the ebb and flow of cultural movement.

**BIOCHEMICAL CONTRIBUTIONS TO ENDOCRINOLOGY: Experiments in Hormonal Research**—Sir Charles Dodds—*Stanford University Press*, 76 p., illus., \$3.00. Lectures delivered at Stanford by a scientist from London.

**THE CALCULATION OF ATOMIC STRUCTURES**—

Douglas R. Hartree—*Wiley*, 181 p., diagrams, \$5.00. For users of the results of calculations and for those who may wish to make them, this book offers understanding.

**A CHANCAY-STYLE GRAVE AT ZAPALLAN, PERU: An Analysis of Its Textiles, Pottery and Other Furnishings**—S. K. Lothrop and Joy Mahler—*Peabody Museum*, Papers, Vol. L, No. 1, 38 p., 17 plates, paper, \$2.50. Description of ancient graves, one of which contained the mummy of a woman who was evidently someone of importance in a poor community. Twenty-two fabrics were found, some of which had been much mended before use in the burial.

**THE DEVELOPMENT & MEANING OF EDDINGTON'S "FUNDAMENTAL THEORY"**: Including a Compilation From Eddington's Unpublished Manuscripts—Noel B. Slater—*Cambridge University Press*, 299 p., \$7.50. The text of this posthumous work together with the previously unpublished manuscripts show how the theory developed towards coherence.

**DOCUMENTATION AND INFORMATION RETRIEVAL: An Introduction to Basic Principles and Cost Analysis**—J. W. Perry and Allen Kent—*Press of Western Reserve University (Interscience)*, 156 p., diagrams, \$5.00. A report of research in progress.

**EARTH SATELLITES**—Patrick Moore—*Norton*, 157 p., illus. with drawings by Irving Geis, \$2.95. To give the general reader an idea of what is actually planned for the earth satellite program, and how to tell fact from fiction in the realm of outer space.

**EVOLUTION IN ACTION**—Julian Huxley—*New American Library*, 141 p., illus., paper, 50 cents. In this rapid survey of evolution, the author stresses its unity, including the history of mankind. Inexpensive, pocket-size edition of a book originally published by Harper.

**FACTORS AFFECTING THE APPEARANCE OF PICTURE VARNISH**—Robert L. Feller—*Mellon Institute*, 2 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Discussing the refractive index of picture varnishes as affecting the appearance of the paintings.

**FORTETSA: Early Greek Tombs Near Knossos**—J. K. Brock—*Cambridge University Press*, 224 p., illus., \$23.50. A lavishly illustrated report of a British party that excavated a series of early Greek tombs in 1933-1935. From the shape and decoration of the pottery and the grouping of burials it has been possible to establish a continuous sequence of ceramic phases covering a span of nearly four centuries.

**HELPING YOURSELF WITH PSYCHIATRY: A Practical Guide to Wiser and Healthier Living**—Frank S. Caprio—*Prentice-Hall*, 256 p., \$4.95. A book of psychiatric self-help for the unhappy and fear-ridden. The author is a psychiatrist.

**HISTOLOGY**—Arthur Worth Ham—*Lippincott*, 3d ed., 894 p., illus., \$11.00. Since the first edition of this book, effective magnification has been raised from something over 1,000 to perhaps 100,000. This edition contains a chapter on electron microscopy. Special consideration is also given to transplantation of tissues.

**INDUSTRY AND TECHNICAL PROGRESS: Factors Governing the Speed of Application of Science**—C. F. Carter and B. R. Williams on behalf of the Science and Industry Committee—*Oxford University Press*, 244 p., \$4.00. Many applications of science, it is shown, require the co-ordinated advance of a whole chain of firms. Necessary, too, is the preparation and proper distribution of trained talent.

**JOHNNY'S FIRST VISIT TO HIS DENTIST**—

Josephine Abbott Sever—*Children's Medical Center*, 29 p., illus., paper, 50 cents. A story you can read to the Johnnies in your own family to prepare them for what they may experience in the dentist's office, and so prevent unnecessary fears.

**LATE MOGOLLON COMMUNITIES: Four Sites of the Tularosa Phase, Western New Mexico**—Paul S. Martin, John B. Rinaldo and Eloise R. Barter—*Chicago Natural History Museum, Fieldiana: Anthropology*, Volume 49, Number 1, 144 p., illus., paper, \$4.00.

**LIGHT SCATTERING BY SMALL PARTICLES**—H. C. van de Hulst—*Wiley*, 470 p., diagrams, \$12.00. Hardly ever is light observed directly from its source, so everyone engaged in the study of light or its industrial applications meets the problem of scattering.

**MARIANAS PREHISTORY: Archaeological Survey and Excavations on Saipan, Tinian and Rota**—Alexander Spoehr—*Chicago Natural History Museum, Fieldiana: Anthropology* Volume 48, 187 p., illus., paper, \$4.50. A radiocarbon date of 1527 B.C. was obtained for a layer of oyster shell on Saipan. The four feet of cultural material below the oyster shell must be considerably older.

**THE NILE: A General Account of the River and the Utilization of Its Waters**—H. E. Hurst—*Constable (Macmillan)*, rev. ed., 331 p., illus., \$6.00. This great river is of particular interest to geographers and also to archaeologists, engineers, and hydrologists.

**PEABODY MUSEUM OF ARCHAEOLOGY AND ETHNOLOGY NINETEENTH REPORT 1955-56**—John Otis Brew, director—*Peabody Museum*, 55 p., paper, free upon request direct to publisher, Cambridge, Mass. Reporting progress during the year in a variety of archaeological programs.

**PERSONAL PROBLEMS & PSYCHOLOGICAL FRONTIERS: A Cooper Union Forum**—Johnson E. Fairchild, Ed.—*Sheridan House*, 320 p., \$4.00. Outstanding individuals from various fields delivered these lectures in the Cooper Union series for Adult Education.

**PREHISTORIC MAN**—A. Leroi-Gourhan. Translated from French by Wade Baskin—*Philosophical Library*, 121 p., illus., \$4.75. Telling what archaeologists have been able to piece together about the lives of our most remote ancestors.

**THE PRESIDENT'S COMMITTEE ON EDUCATION BEYOND THE HIGH SCHOOL SECOND REPORT TO THE PRESIDENT**—Deveraux C. Josephs, Chairman—*Govt. Printing Office*, 108 p., paper, 55 cents. Addressed to the public, not to educators, this report discusses the need for teachers, need for assistance to students, need for planning of educational opportunities, financing and what the Federal Government can do.

**PROSPECTING FOR URANIUM**—U. S. Atomic Energy Commission and the U. S. Geological Survey—*Govt. Printing Office*, rev. ed., 217 p., illus., paper, 75 cents. Telling interested persons where to look for uranium, how to prospect for it and how to cash in on any finds.

**RECENT PROGRESS IN HORMONE RESEARCH: Volume XIII, Proceedings of the Laurentian Hormone Conference 1956**—Gregory Pincus, Ed.—*Academic*, 646 p., illus., \$12.80. The hormones function in practically every one of the vital processes that make for the development, growth, maintenance, adaptation and reproduction of living organisms.

**ROADSIDE DEVELOPMENT REPORT OF COMMITTEE**—Frank H. Brant, Chairman—*Highway Research Board*, 88 p., illus., paper, \$2.00. Includes plans for roadside rest areas every 40 miles or so, or one hour's normal driving time.

**SURGEONS ALL**—Harvey Graham, foreword by Oliver St. John Gogarty—*Philosophical Library*, 459 p., illus., \$10.00. Tracing the fascinating history of surgery back to the New Stone Age when a Neolithic surgeon trepanned a sick man's skull. This is the oldest operation of which any evidence remains.

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**VANISHED CITIES**—Hermann and Georg Schreiber, translated from the German by Richard and Clara Winston—*Knopf*, 358 p., illus., \$5.75. In this readable book, the authors restore the vanished peoples to long-ruined cities of the past.

Science News Letter, August 24, 1957

#### GEOPHYSICS

### IGY Data Center Opens in Washington

► **THE FIRST** information center for the International Geophysical Year in the United States is now in operation by the U. S. Coast and Geodetic Survey in Washington, D. C.

The record center will house the complete original results of all IGY experiments on the earth's magnetism, earthquakes and the pull of gravity conducted in the Western Hemisphere. Data will be exchanged with foreign centers.

The office is one of 11 being set up in the U. S. and Alaska to record all data gathered in the various fields of scientific endeavor into which the IGY has been divided. The IGY, which started July 1, is an 18-month scientific assault on the earth, its seas and atmosphere.

Science News Letter, August 24, 1957

#### PHYSIOLOGY

### Find "Growth Rings" In Snake Bones

► **BONES** of living creatures may show dry and wet seasons in somewhat the same manner as "growth rings" on trees.

Dr. Frank E. Peabody, zoologist at the University of California at Los Angeles, finds this is possible after studying a matching series of annual growth rings in several head bones of a Kansas bullsnake.

The snake bone growth rings consist of 11 narrow winter zones and 12 broad, summer zones, Dr. Peabody reports. Winter zones show a tendency to become wider and to appear double, suggesting a small, local increment of growth following the regular growth season—perhaps reflecting Indian summer.

In the middle of the 11½-year record in bone are two summer zones which are unusually narrow. Inasmuch as the bullsnake was known to have been killed in a specific year, 1931, the two summers of deficient growth during its midlife can be identified with reasonable accuracy as the summers of 1925 and 1926, according to Dr. Peabody.

The UCLA zoologist checked weather records of the area in which the snake lived and found severe droughts occurred in these two summers.

Thus the narrow growth zones may reflect a crisis in the snake's food chain. The drought affected summer vegetation and in turn the number of rodents on which the snake feeds.

Science News Letter, August 24, 1957

#### PUBLIC HEALTH

### Reducing Pills Described As Fraudulent

► **REDUCING PILL** promoters are too fast for the Government and "make a killing" on a gullible public before they can be stopped.

This was reported by Miss Maye A. Russ, director of the food, drug and cosmetic division, National Better Business Bureau, Inc., New York, to a House subcommittee studying false and misleading advertising.

When the Government finally does catch up with the promoters they will quickly agree to discontinue the sale of the product and then, "in contemptuous disregard" of the law, start campaigning for a similar drug or the same one marketed under a different name.

The whole field of weight-reducing products is full of deception and outright fraud, and is particularly fertile for promoters because of the great number of persons worried about their weight, Miss Russ said.

None of the known weight-reducing products sold over the counter will in themselves cause a person to lose extra pounds. This can only be done by reducing the number of calories taken in through food.

Many products claim to induce the user automatically to eat less food. Almost invariably, however, these products are accompanied by a "plan" that requires the user to follow a restricted diet.

Many of the current so-called "miracle" drugs contain the compound phenylpropanolamine hydrochloride which was reported in 1939 as successful in curbing appetites. But the amount of the drug contained in reducing pills is far below the amount originally reported on.

The Post Office Department has forced many of the companies to discontinue the mail order sales of their products, but in some cases vigorous promotion of the products still goes on in drugstores.

Miss Russ called for a stronger Medical Fraud Unit of the Post Office Department and for greater use of criminal prosecution by the Department of Justice.

Science News Letter, August 24, 1957

#### MEDICINE

### Boy Shakes Bullet From Brain After Shooting

► **A RIFLE** bullet that went through an eight-year-old boy's skull and lodged in his brain was shaken loose in about five weeks and removed from the same hole it entered.

The unusual case of "bullet migration" is reported by Drs. C. Verner Thompson, Lodi, Calif., Tom Huff, Stockton, Calif., and Warren Wass, Lodi, in *California Medicine* (July).

The youngster was riding a bicycle and looking back over his shoulder at a companion who, running to catch up with him, tripped and fell, discharging a .22 caliber rifle.

The bullet entered the victim's right forehead, traveled across the brain, and came to rest just under the skull on the other side. He was taken to the hospital half

conscious but within a few hours was out of shock and showed no signs of neurological damage.

He was given antibiotics against any possible infection and the devitalized brain tissue and a few fragments of bone and metal were removed. Then the head wound was closed and an anticonvulsant drug was administered.

He was discharged from the hospital and told to lie face down each night before going to sleep and jar his head against the bedding from time to time.

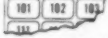
X-ray films taken at intervals thereafter showed the bullet to be slowly traveling back through the brain toward the point of entrance. Five weeks later it was close enough to the original wound to be removed along with several fragments of bone.

The youngster returned to school and has shown no physical or emotional signs of brain damage for a year and a half, the doctors report.

Science News Letter, August 24, 1957

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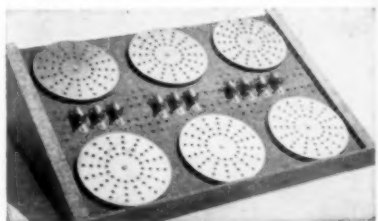
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### MEDICINE

## Machine Spots Cancer

A machine capable of quickly detecting the early stages of one kind of cancer promises to provide doctors with the means for more efficient test analyses.

➤ A MACHINE for instantly detecting the early stages of uterine cancer in women is now undergoing advanced testing by the National Cancer Institute, Bethesda, Md., at the University of Tennessee in Memphis.

Called the Cytoanalyzer, the machine scans microscope slides containing specimens from vaginal smears and can indicate within less than a thousandth of a second if the cells look suspicious enough for further study by a pathologist.

The importance of the Cytoanalyzer is that it may be able to eliminate the scarcity of trained technicians now needed to analyze test results, Surgeon General Leroy E. Burney, U. S. Public Health Service, said.

At present, each slide must be examined individually under a microscope, and any suspicious specimens are referred to a pathologist. But if the Cytoanalyzer is sufficiently perfected it will be able to screen slides almost as fast as they are fed into the machine.

"We are hopeful that this will allow for millions of additional cell examinations without the training of thousands of additional persons," Dr. John R. Heller, director of the National Cancer Institute, reported.

The machine has four main sections: a scanning microscope, a computer and analyzer, and a recorder.

The scanner examines the slide and converts the optical picture it sees into an electric current. The current varies according to the size and density of the cells, and is

fed into the computer section which distinguishes between signals arising from normal and suspicious cells and makes a graph of the cells' nuclear measurements on an oscilloscope tube. A permanent record of the graph is then made by a camera in the recorder which records the decision of the automatic smear classifier.

The Cytoanalyzer which will be in operation in Memphis was developed by the Airborne Instruments Laboratory, Inc., Mineola, N. Y., under grants from the National Cancer Institute and the American Cancer Society.

Science News Letter, August 24, 1957

### CHEMISTRY

## Auto Exhaust Blamed for Smog and Air Pollution

➤SUSPICION that automobile exhaust gases are the main cause of smog and other polluted air conditions found in major cities has been confirmed.

Four scientists have also isolated and identified the mysterious "compound X," first discovered in polluted air during 1956 and believed to contribute to smog formation.

The scientific sleuthing of two mechanical smog detectives, "Silent Sam," the stay-at-home laboratory instrument, and his trailer-mounted roving twin, was described at the meeting of the American Petroleum Institute in Philadelphia. Both "Sams" are especially-built, long-path infrared spectrometers that can spot as little as five parts of pollutant in 100,000,000 parts of air.

The original instrument is permanently housed in the Franklin Institute, Philadelphia.

Franklin Institute scientists reported making artificial smog and comparing its chemical analysis with the composition of automobile exhaust gases. The two were very similar. Then a mobile team collected samples of Los Angeles smog, as well as air samples from heavy traffic intersections and found the two similar. By taking samples at night when there could be no photochemical reaction due to the sun, the scientists eliminated many other possible types of combustion as causing smog.

The scientists also found several typical polluted air samples were closely similar to automobile exhaust diluted with air.

Drs. W. E. Scott, E. R. Stephens, P. L. Hanst and R. C. Doerr of the Institute isolated "compound X" and determined its composition and approximate structure. It has been identified as peroxyacetyl nitrite and is believed to be involved in photochemical reactions leading to smog formation.

Science News Letter, August 24, 1957

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## Do You Know?

**Cavitation** damage, or the erosion caused by the formation and collapse of bubbles in liquids, is a major cause of breakdown in hydraulic machinery, from tiny pumps to gigantic ship propellers.

**Harlow**, a new town in a great British experiment in town planning, is a balanced and self-contained community where nobody needs to work more than ten minutes commuting distance from home.

When a **missile** travels at velocities above 5,000 miles per hour the heating of the air by compression and friction heats it to incandescence.

### PHYSICS

## Foucault Pendulum Proves Earth Rotates

### See Front Cover

► A **FOUCAULT** pendulum has been installed at the Natural History Museum in Balboa Park, San Diego, Calif. The device, invented in 1851 by the French physicist, Jean Foucault, gives visual proof of the earth's rotation.

A bob swings back and forth over a dial, around which it appears to move clockwise. Actually the plane of swing remains the same and the dial and the earth are revolving counter-clockwise under the pendulum. The pendulum is not a perpetual motion machine. It requires energy to replace that lost because of friction.

What is needed is an activating mechanism that does not exert a directional pull on the pendulum. The pendulum shown on the cover of this week's **SCIENCE NEWS LETTER** has a magnet which encircles the suspending cable near its point of attachment. The magnet has electronic controls which trigger its pull just as the pendulum passes center, providing a slight tug to the cable on each swing.

The brass bob is 17 inches in diameter and weighs 185 pounds; the cable is 43 feet long, giving the pendulum a 6.56-second period of swing.

Science News Letter, August 24, 1957

## Questions

**ASTRONOMY**—How do scientists explain the darkness of the carbon stars? p. 119.

□ □ □

**CHEMISTRY**—What determines if a ruby is red or green? p. 121.

□ □ □

**MEDICINE**—What affect do the citrus flavonoids have on blood vessels? p. 117.

□ □ □

**PUBLIC HEALTH**—What is the value of the whole body counter in measuring radiation in the body? p. 115.

□ □ □

Photographs: Cover, Natural History Museum, San Diego, Calif.; p. 115 and p. 118, General Electric Company; p. 117, Joseph B. Brignolo; p. 123, University of Michigan-F. D. Miller; p. 128, Bakelite Company.

### SOCIOLOGY

## Tourists Revive 1,500-Year-Old Style

► **TOURISTS** and artists are given credit for causing the revival of a style of woman's dress that has been in use on and off in Mexico for 1,500 years or more. During that time it has persisted consistently in certain Indian areas.

The garment is called a "quechquemid." It is similar to a short cape or poncho and is slipped over the head to cover shoulders, back and chest. Made of cloth rectangles, as worn it looks more like a triangle with one point hanging down in front. The garment is described in the journal of the Southwest Museum, *Masterkey* (March-April), in a report by Dr. John Dewar of the Museum staff.

It is worn by fashionable women in Mexico City today, but many centuries ago Aztec women wore the quechquemid, as shown on ancient codices and pottery figurines. It is made of various materials from finely woven gauze to richly embroidered wool.

In the United States, the quechquemid is called a "sweater poncho" by the world of fashion.

Science News Letter, August 24, 1957

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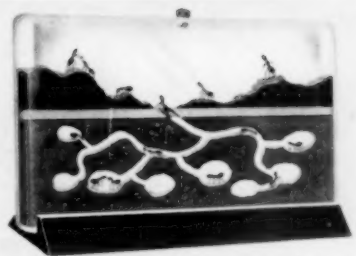


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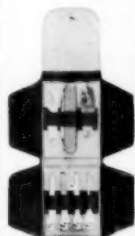
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✿ **ALUMINIZED CAPS** for golfers, outdoorsmen and ball-players reflect the sun's heat. Laboratory tests are said to have shown that the caps keep heads up to 20% cooler. The thin layer of aluminum does not add materially to the weight of the cap.

Science News Letter, August 24, 1957

✿ **PAN HOLDER** eliminates the need for a permanent pan on camping trips. Picnicle-like fillers are used for cooking and then thrown away. The holder takes disposable plates measuring ten inches in diameter.

Science News Letter, August 24, 1957

✿ **ANTI-JACKKNIFE DEVICE** for tractor-trailers is said to be a mechanical invention that not only prevents "jackknifing," but keeps trailers from breaking away from the towing vehicle. Independent of the driver, the device is automatic. It can be mounted by welding or bolting and is interchangeable.

Science News Letter, August 24, 1957

✿ **RAIN SCARF** made of plastic can be folded to fit in pocket or purse. Styled to cover shoulder-length hair-dos, the scarf, shown in the photograph, is provided with a snap fastener. The plastic is resistant to



most chemicals, weather, water and mildew. A brim can be fastened to the rest of the scarf. The scarf comes in a pack-away pouch.

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✿ **TOY RACER** is equipped with a finely engineered .049 engine. An automatic clutch allows the car to be placed on the

ground with the engine running. The racer holds enough fuel for 12 minutes track time. The 10¼-inch model is made to scale.

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✿ **COMPOST MAKER** is described as capable of turning out 5,000 pounds of compost yearly. Leaves, weed clippings and other material is placed in the top of the wood and metal composter and the finished compost is shaken out the bottom.

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✿ **TROPICALIZED URANIUM DETECTOR** is a British development designed to be mounted on a small vehicle, but the driver can take the scintillation probe with him. The probe is described as sensitive enough to pick up a change of plus or minus .0005% in .003% radioactive ore in bed-rock.

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✿ **DUST COLLECTOR**, described as one-tenth to one-twentieth the size of comparable equipment, weighs 2,500 pounds. The collector can catch particles one five-thousandth of an inch in size. A two-part device essentially, it has a mixer section and an eliminator section. The collector is designed for industrial use.

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## Nature Ramblings



### By HORACE LOFTIN

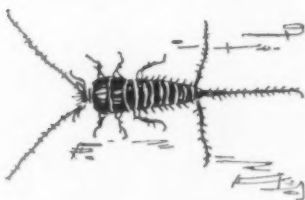
► IN ALL the animal kingdom, only three major groups show true, functional wings—birds, mammals and insects. Fossil remains of flying reptiles, the pterodactyls, are well-known, but these creatures perished countless ages ago.

Among the mammals only the bats are winged. On the other hand, there are no wingless birds, although there are many flightless ones like the ostrich. But for variety of winged and wingless condition the insects are champions.

In the first place, no insect has functional wings until it is grown or nearly so.

There are also several groups of insects that never show signs of wings at any stage of their life history. Such an insect is the familiar silver fish, shown in the picture. Studies of fossils of the ancestors of these insects have failed to disclose the presence of even vestigial wings.

### Winged and Wingless



Still other groups of insects, such as the fleas and lice and some of the aphids and ants, do not have wings; however, these are "degenerate," for their ancestors were winged.

Some ants and termites illustrate another variation. These soil-dwelling insects may display a beautiful pair of wings which take them on a single mating flight. But after this momentary release, they lose their wings to spend the rests of their days in and on the earth.

Of course, the beautiful and effective wings of the great majority of the insect tribe are well-known, although they range from the covered and folded wings of beetles to the great appendages of tropical moths and butterflies. Some of the moths may have a wingspread of 11 inches. At the other end of the scale, certain parasitic insects barely reach 1/100 of an inch in wingspread.

Insect wings originate as hollow sacs that protrude from the body wall of the undeveloped young. When the last metamorphosis or body change occurs, the sac enlarges and then flattens so that the two walls form a single tough membrane.

In certain areas, the walls do not fuse but thicken to form strong hollow tubes—the veins. These have nothing to do with blood circulation, but are for support. Insect wings contain no bones, muscles, feathers, nerves or blood vessels.

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